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THE VIEW OF IT-CONSUMING FIRMS ON THE KEY DIGITAL SERVICE CAPABILITIES OF IT-PRODUCING FIRMS

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ABSTRACT

Aim/Purpose	This study focuses on the connection between IT-producing firms' digital service capabilities and the digital service performance of IT-consuming firms, especially online shop operators.
Background	The acquisition and integration of knowledge regarding digital service capabilities and performance can increase the level at which employees assimilate information, organize with IT-consuming firms, and cooperate with them to develop the delivery of services and customize services to fill their needs. Exploring capabilities that may enable this process is a prerequisite for all businesses offering digital services and, thus, an engrossing and ongoing interest of practitioners and scholars. However, there is a lack of research on the relationship between IT-producing firms' digital service capabilities and the digital service performance of IT-consuming firms in the business-to-business (B2B) context.
Methodology	The study builds on a survey conducted among small firms that have an online shop in use and are located in Finland.
Contribution	The study offers empirical evidence for the capabilities valued by IT-consuming firms, providing a model for IT-producing firms to use when deciding on a future focus. The study was executed in a B2B setting from the viewpoint of online shop operators, presenting a novel understanding of influential digital service capabilities.
Findings	Adaptability, determined by capabilities related to utilizing information gained via the integration of a digital product into other digital tools (e.g., marketing,

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	personalization, and analytics), statistically significantly affects all three aspects of an IT-consuming firm's digital service performance (financial, operational, and sales). Another product capability, availability, which includes aspects such as security, different aspects of functioning, and mobile adaptation, affects one aspect of digital performance, namely operational. The results also suggest that the role of service process-related capabilities in determining service comprehensiveness significantly influences two aspects of IT-consuming firms' digital service performance: financial (negative effect) and operational (positive effect). The results show that the capabilities associated with the relationship between the producing firm and the consuming firm do not affect IT-consuming firms' performance to the same extent.
Recommendations for Practitioners	The study results suggest that IT-producing firms should concentrate on leveraging service comprehensiveness, as there has been a shift in the B2B context from merely selling a digital product and associated services. It seems that usability-related issues are now taken for granted, and the emphasis is on features that support the use of information to create value.
Recommendations for Researchers	The results contribute to the capabilities literature by showing that the shift in focus from technical product-related capabilities to relationship-related capabilities is not yet evident among small online store operators.
Impact on Society	In addition to offering tools with different integration possibilities, supporting IT-consuming firms in making the most of the possibilities would be very helpful.
Future Research	The comprehension of the relationship between digital service capabilities and digital service performance would benefit from future research that takes into account additional control variables. The theoretical model of this study can be further studied by using other performance measures, such as market performance, as dependent variables.
Keywords	product capabilities, service capabilities, relationship capabilities, digital service, performance

INTRODUCTION

Digital transformation has changed the nature of services, compelling companies to revise their knowledge and skills in a digital context (Sjödin et al., 2020; Sore et al., 2022). In particular, using information to enhance customer value creation is critical to building digitalization capabilities (Parida et al., 2015). With the promise of meeting consumers' increasing expectations, IT-producing firms are increasingly committing themselves to building capabilities related to digital services (Hinings et al., 2018; Ngo & O'Cass, 2013; Oliveira & Roth, 2012; Sore et al., 2017). The main idea of the digital era is that it is transforming the current business world in a holistic and customer-driven manner by modifying operations, for example, by digitizing processes and generating e-services. This requires digital service capabilities that refer to "operations-based service proficiencies that are necessary for enhancing the value of digital service delivery" (Sore et al., 2017, p. 573). Thus, IT-producing firms' digital service capabilities refer to the proficiencies necessary to deliver digital services to IT-consuming firms. The capabilities are divided into capabilities related to product-service combination, the service delivery process, and the corresponding relationships. These capabilities are deployed by IT-producing firms throughout the service delivery process and are deeply integrated with IT-consuming firms' cooperative processes, thus advocating higher rates of collaboration (e.g., Chuang & Lin, 2015). Further, IT-producing firms using new information technology-based services have access to

more customer data through IT-consuming-firm–IT-producing-firm cooperation and interactive actions on the web (Chuang & Lin, 2015). Entry into and unification of this knowledge can increase the level to which employees assimilate information, organize with IT-consuming firms, and cooperate with them to develop the delivery of services and customize services to fill their needs (Chuang & Lin, 2015). Exploring the capabilities that may assist in enabling this process is a prerequisite for all businesses offering digital services, and thus, an engrossing and ongoing topic for practitioners and scholars. However, there is a lack of research on the relationship between IT-producing firms' digital service capabilities and the digital service performance of IT-consuming firms in the business-to-business (B2B) context. This is an important topic to study, as value creation in a B2B context differs from that in a business-to-consumer (B2C) context (Saunila et al., 2019; Sore et al., 2022).

This study addresses this research gap by examining IT-producing firms' digital service capabilities, which may determine the digital service performance of IT-consuming firms. The results are based on a survey conducted on online shop operators (i.e., IT-consuming firms) located in Finland. The initial sample was randomly selected from among these small firms, and 109 valid responses were received. The analyses showed that all three types of capabilities were somewhat interrelated with digital service performance. The size of the IT-consuming firm did not influence digital service performance. Our investigation of the capabilities necessary for digital service delivery from the perspective of the online store operator is novel. We contribute to service capability and IT consumption research by offering a viable model of various determinants of digital service performance.

The remainder of the article is structured as follows. The next section deals with the theoretical framework that considers digital service capabilities. The third section concentrates on the development of the hypotheses and the presentation of the research model. In the fourth section, the research methodology is discussed, followed by a description of the data analysis of the validity tests and hypotheses. In the fifth section, the research findings are discussed. Lastly, the theoretical implications, managerial implications, limitations, and further research directions are presented.

DIGITAL SERVICE CAPABILITIES

We build our study on the resource-based view (RBV), which suggests that firms possess unique resources that assist them in attaining a sustainable competitive advantage (Barney, 1991; Melville et al., 2004). However, the increase in external partnerships has drawn attention to the importance of inter-organizational resources (Mathews, 2003). Resources (IT-producing firm resources in this study) beyond organizational boundaries benefit focal firm performance. Relying on the classification of resources into assets and capabilities (Piccoli & Ives, 2005; Wade & Hulland, 2004), we define capabilities as proficiencies of actions deploying assets to reach desired outcomes (Amit & Schoemaker, 1993; Wade & Hulland, 2004). In the context of this study, IT-producing firm capabilities refer to capabilities related to products, services, and relationships. These three subcategories are based on the original work of Lapierre (2000) and have been used by several previous studies (e.g., Saunila et al., 2017). Table 1 shows the contents of the subcategories based on several studies on the quality of products, services, and relationships (Blut et al., 2015; Gao et al., 2021; Gotzamani & Tzavlopoulos, 2009; E. Y. Huang et al., 2015; Oliveira & Roth, 2012; Parasuraman et al., 2005; Tzavlopoulos et al., 2019; Wagner et al., 2020; Zeithaml et al., 2002; R. Zhang et al., 2021; Ziaie et al., 2021; Zou et al., 2021). This categorization is used as a framework for the study. These three capabilities are introduced next.

PRODUCT CAPABILITIES

Product capabilities can be defined as proficiencies in exploiting the features of a digital product to create value for users. In the previous literature, features defining the quality of a digital product have been categorized in several different ways and explored, for example, in the context of mobile commerce and e-commerce (e.g., DeLone & McLean, 2003; Gotzamani & Tzavlopoulos, 2009; E. Y. Huang et al., 2015; Mahmood et al., 2008; Oliveira & Roth, 2012; Omar et al., 2021; Parasuraman et

al., 2005; Rita et al., 2019; Tzavlopoulos et al., 2019; Wagner et al., 2020; Zeithaml et al., 2002; R. Zhang et al., 2021). Furthermore, the features have also been studied in a general context, such as using information technology for specific purposes, such as postal services and mobile banking, to create value for a firm or its current or potential customers (Benaroch & Appari, 2011; Chuang & Lin, 2015, 2017; Hinings et al., 2018; Ziaie et al., 2021). However, the distinct uses of the concept of product capabilities related to the features of a digital product are combined in this study into three categories: usability, availability, and adaptability. These categories are introduced next.

The first category, usability, is considered a fundamental feature of a digital product by DeLone and McLean (2003), who introduced e-commerce success metrics. Ease of use through the design of a digital product (McLean et al., 2018), efficiency (Parasuraman et al., 2005), attractiveness (R. Zhang et al., 2021), navigation patterns (Mahmood et al., 2008), esthetics (Rita et al., 2019), structure, and ancillary features (Gotzamani & Tzavlopoulos, 2009) have been discovered to be essential for the perceived value of a digital product.

The second category, availability, including features such as accessibility, response time, and error-freeness, has also been found to be a crucial feature of a successful digital product (DeLone & McLean, 2003; Gotzamani & Tzavlopoulos, 2009; Huang et al., 2015; Mahmood et al., 2008; Omar et al., 2021; Parasuraman et al., 2005). Gotzamani and Tzavlopoulos (2009) and Rita et al. (2019) also considered features connected to the use of a digital product crucial, such as security and privacy, along with payment and transaction functionalities. Parasuraman et al. (2005) and E. Y. Huang et al. (2015) further highlighted the importance of the privacy features of a digital product, whereas DeLone and McLean (2003) and Mahmood et al. (2008) emphasized security features. Privacy is considered to be the degree to which IT-consuming firms' information and behavior are protected, whereas security represents features that keep a digital product safe from attacks (Mahmood et al., 2008; Parasuraman et al., 2005; Rita et al., 2019; Zhu & Kraemer, 2002).

The third category, adaptability, is also considered an important feature of a digital product (DeLone & McLean, 2003). Zhu and Kraemer (2002) and Zhu (2004) emphasized the importance of integrating a digital front-end product with corporate back-end systems. Integrating and analyzing data from different sources provides relevant knowledge to firms to improve the quality of their e-service systems in many different ways, such as enhancing operational efficiency and effectively meeting customers' requirements (Benaroch & Appari, 2011; Chuang & Lin, 2017; Ulaga & Eggert, 2006).

SERVICE CAPABILITIES

This study follows Sousa and da Silveira's (2017) definition of service capabilities as functions that support the delivery of relevant and interactive service processes for IT-consuming firms. Bundled together, service capabilities constitute a set of tightly connected inner activities that comprise the IT-producing firm's proficiencies related to service delivery. These proficiencies determine the IT-producing firm's capability to deliver value-added services to IT-consuming firms. Service capabilities are important when the production and consumption of a service are interrelated (X. Zhang & Chen, 2008). Thus, IT-producing firms need to resettle service-specific capabilities to provide product-service combinations. These investments include operational capabilities related to service delivery (Kastalli & Van Looy, 2013), which has been described as the means of "how" the service is provided to the consuming firms (Ponsignon et al., 2011). Thus, service capabilities comprise a set of functions that are united with the delivery of products and services (Setia et al., 2013). In this study, the capabilities related to service delivery were mapped into two categories: service ability and service comprehensiveness (cf. Roth & Menor, 2003; Setia et al., 2013; C. C. Yang et al., 2009). These two categories are introduced next.

The first category, service ability, represents the overall grade of the service within the service delivery process by considering the ability to monitor IT-consuming firm needs and to meet those needs effectively. For example, the role of the individuals conducting the service, as well as the role of

technology and equipment (Ponsignon et al., 2011), has been highlighted as crucial in-service delivery. C. C. Yang et al. (2009) studied service capability in logistics and concluded that the courtesy of sales representatives, as well as reliability and accuracy, are considered important attributes of logistics service capability. C. S. Yang (2016) considered that consuming firms value reliability, flexibility, and efficiency as the service capabilities of producing companies, and Gao et al. (2021) further emphasized overall service excellence.

The second category, service comprehensiveness, refers to meeting IT-consuming firms' direct and indirect affections and providing unique replies to IT-consuming firms' requisitions based on those affections (Oliveira & Roth, 2012). Following Roth and Menor (2003), we consider service comprehensiveness to include dimensions of the core and peripheral services. Capabilities linked to core services can be considered related to meeting the expressed needs of consuming firms, while peripheral services are complementary and include capabilities to provide customers with solutions to their latent and future needs, thus generating added value (Blocker et al., 2011; Möller, 2006; Roth & Menor, 2003). Regarding digital products, the focus is on customizing the core product; that is, modifying the digital product according to the customer's individual needs (Ziaie et al., 2021).

RELATIONSHIP CAPABILITIES

In this study, relationship capabilities are defined as a firm's capacity to change information beyond different forums and to compound information from different origins (Chuang & Lin, 2015). Participation in different relationship forums with different parties (Capaldo, 2007; Hertwig, 2012) highlights the significance of a firm's learning processes and experiences, through which it can obtain and generate knowledge on how to optimally control its relationships (Kale & Singh, 2007). This capability, thus, is closely connected to relationship learning, which is defined as a process for improving forthcoming manners in a connection or a shared, cooperative operation in which two firms strain to generate more value in conjunction than they would generate separately or with other parties. This construct is multidimensional, with multiple aspects, including information exchange and knowledge unification (Cheung et al., 2010; Selnes & Sallis, 2003), as well as trust and commitment (Gansser et al., 2021; Zou et al., 2021).

In this study, the participation capability related to the IT-consuming and IT-producing firm's relationship (i.e., relationship capability) was mapped into two categories: responsiveness to the IT producer, and IT producer credibility (c.f. Cheung et al., 2010; Gotzamani & Tzavlopoulos, 2009; E. Y. Huang et al., 2015; Parasuraman et al., 2005; Selnes & Sallis, 2003). Credibility relates to the IT-consuming firm's previous experiences with the IT-producing firm, the producer's reputation, and their willingness to conduct a long-term partnership. Willingness to develop trust has been presented as an essential element of relationship capability (Gansser et al., 2021; Poppo et al., 2008; Zou et al., 2021), referring to the reliance that the collaborator occupies on the integrity and complaisance of other collaborators (Kumar et al., 1995). The length of cooperation has been presented as a trust-enhancing factor (Poppo et al., 2008). The producer's corporate image and reputation are unified with the development of trust (Gotzamani & Tzavlopoulos, 2009; E. Y. Huang et al., 2015; Lapierre, 2000; Parasuraman et al., 2005). Moreover, it has been shown that when behavioral norms and trust are generated, collaborators are more efficient in enhancing information flow, communication, solidarity, and knowledge sharing (Hult et al., 2004; Leonardi & Treem, 2012). Responsiveness refers to an IT-consuming firm's willingness to participate in the service process, share information, and respond to producer requests. In the production of digital services, customer participation is of paramount importance for achieving the best results (Rahmati et al., 2021; J. Zhang & Zhu, 2019). Successful co-development requires close cooperation and input from both parties (Zou et al., 2021); thus, the customer must share firm-specific and tacit information with the IT-producing firm (Rahmati et al., 2021).

DIGITAL SERVICE PERFORMANCE

Performance is an umbrella term that encompasses all factors associated with the success of a company and its operations, thus covering both financial and operational aspects (Tangen, 2005). Performance, therefore, relates to an understanding of how an organization is able to conduct its operations such that it leads to success (Chatterjee et al., 2021; Mithas et al., 2011). It has long been accepted in the literature that digital services combined with other organizational resources have a positive impact on company performance (e.g., Bharadwaj, 2000; Chuang & Lin, 2015; Powell & Dent-Micallef, 1997; Seufert et al., 2021; Wade & Hulland, 2004), but there is no consensus as to which performance indicators best describe that performance (Gellweiler & Krishnamurthi, 2021). Although the focus of research has long been on financial performance (Gellweiler & Krishnamurthi, 2021; Kohli & Grover, 2008; Ong & Chen, 2014), it is generally accepted that the performance of digital services cannot be measured from financial perspectives alone (Priambodo et al., 2021). This is because the impacts of digital services have often been found to appear as determinants of financial performance (Ågerfalk et al., 2020), such as operational efficiency (e.g., Chatterjee et al., 2021). Thus, digital services have been found to have economic impacts on, for example, financial performance (e.g., Fernández-Portillo et al., 2022) and sales performance (e.g., Eller et al., 2020), as well as on a company's operational performance (e.g., Pathak et al., 2019). Given that the impact of digital services on performance is manifold, we define digital service performance as a multidimensional construct that encompasses financial, sales, and operations performance.

RESEARCH MODEL AND HYPOTHESES

PRODUCT CAPABILITIES AS ANTECEDENTS OF DIGITAL SERVICE PERFORMANCE

Product capabilities may be determined as the proficiencies for harnessing a digital product to create value for its users. For this purpose, a digital product should be of great quality; that is, contain all necessary features to make it possible to achieve set goals. Numerous studies have shown that excellent digital product quality leads to higher perceived value and satisfaction, and consequently results in higher organizational performance (DeLone & McLean, 2003; Mahmood et al., 2008; Wang, 2008; Zhu, 2004; Zhu & Kraemer, 2002). DeLone and McLean (2003) introduced a renewed D&M IS success model for assessing the prosperity of an e-commerce system, which was a slight modification of their original model (published in 1992) for measuring the success of information systems. They argued that system quality, referring to features of an e-commerce system (such as reliability, usability, response time, adaptability, and availability), plays a considerable role in making an e-commerce system successful (DeLone & McLean, 2003). Wang (2008) respecified the D&M success model based on the information systems success and marketing literature but stuck to the conclusion that e-commerce system quality, measured by user-friendliness and ease of use, has an implicit impact on benefit metrics (e.g., grown sales per customer, net profit, and market share). Mahmood et al. (2008) investigated e-commerce success drivers, and their results emphasized the importance of online system quality (e.g., visual attractiveness, availability, security, and access time) and effectiveness in achieving e-commerce business success. Zhu and Kraemer (2002) established a positive relationship between e-commerce capability and inventory turnover. The developed e-commerce capability measures are formed into four categories: information (e.g., search capability), transaction (e.g., security), customization (e.g., content personalization), and producer connection (e.g., integration to back-end IS; Zhu & Kraemer, 2002). Zhu (2004, p. 195) emphasized the importance of “the integration between front-end e-commerce capability and back-end IT infrastructure in order to reap the benefits of e-commerce investments.”

In summary, superior product capabilities are crucial in making digital products successful. This study proposes that firms are expected to gain higher digital service performance when the product is characterized by usability, availability, and adaptability. The producer, who pays attention to product

quality, puts emphasis on the firm's operations to manage customer needs. In this sense, we believe that product features reflect the demands of the customer and are thus considered the driver of digital service performance. Consequently, the theoretical discussion above led us to believe that product capabilities related to product features explain the various dimensions of digital service performance. Thus, we advance the following hypotheses:

H1: Product capabilities positively affect digital service performance.

H1a: Usability positively affects digital service performance.

H1b: Availability positively affects digital service performance.

H1c: Adaptability positively affects digital service performance.

SERVICE CAPABILITIES AS ANTECEDENTS OF DIGITAL SERVICE PERFORMANCE

Service capabilities can be viewed as capabilities that support the delivery of consuming firm-centered and interactive service processes. Service delivery is the practice through which an IT-producing firm customizes its products or services to better meet IT-consuming firms' needs. Thus, IT-producing firms' capability to manage service delivery based on the consuming firm's requirements is an essential delivery action (Ngo & O'Cass, 2013). As indicated previously, service capabilities are used to meet consuming firm needs by ensuring higher-quality products or services (Y. F. Yang, 2012). For example, customizing a B2B platform can significantly increase the consuming firms' experience and the efficacy of the trade (Oliveira & Roth, 2012). Oliveira and Roth (2012) highlighted customization as a producer behavior for tracking consuming firm preferences and providing customized responses to them. Silvestro and Silvestro (2003) found that it is important to have the service strategically aligned in terms of its delivery systems because it has critical effects on the IT-producing firm's capability to convey service promises and reach operations objectives.

In addition to the contribution of service capabilities to enhancing the quality of products or services, scholars have argued that service capabilities affect business performance (Lai, 2004; Sousa & da Silveira, 2017; C. C. Yang et al., 2009; C. S. Yang, 2016). Chen et al. (2009) used the term service delivery innovation to characterize the process of utilizing specialized expertise and knowledge to deliver services for the customer. They found that renewed service delivery results in enhanced non-financial and financial performance, where financial performance refers to a firm's use of assets to gain revenues, and non-financial performance is a measure of operational success reflecting, for example, increased customer loyalty and a firm's enhanced reputation and image. Service capabilities are also found to be crucial in developing and managing advanced services (Sousa & da Silveira, 2017). Firms' financial performance improves when they develop advanced services which, in turn, require adequate levels of service capabilities (Sousa & da Silveira, 2017). Kastalli and Van Looy (2013) found that viable growth seems useful only to the extent that investments in service capability are transformed into economies of scale. Service capabilities have also been examined in the context of logistics services. Lai (2004) used the term logistics service capability to capture the capacity to generate and deploy resources to satisfy consuming firms' logistics demands, concluding that service capability affects the level of service performance. C. C. Yang et al. (2009) studied container shipping services and found that service capabilities increase the likelihood of achieving superior performance. Sinkovics and Roath (2004) used the term customer orientation to describe a firm's focus on offering prime service quality to customers. The authors found that this orientation improved logistics performance, which reflected the firm's internal efficiency.

Based on the preceding findings, this study proposes that firms are expected to gain higher digital service performance when the producer possesses superior service ability and comprehensiveness. A producer who focuses on the service process emphasizes the firm's operations to manage customer needs. In this sense, we believe that the service process reflects the demands of the customer and is

thus considered the driver of digital service performance. Consequently, service capabilities enhance performance in terms of finances, operations, and sales. Digital service performance is thus enhanced by service capabilities, that is, capabilities related to service delivery. Based on the literature and arguments discussed above, we propose the following hypotheses:

H2: Service capabilities positively affect digital service performance.

H2a: Service ability positively affects digital service performance.

H2b: Service comprehensiveness positively affects digital service performance.

RELATIONSHIP CAPABILITIES AS ANTECEDENTS OF DIGITAL SERVICE PERFORMANCE

Relationship capabilities refer to the ability to build long-term relationships between the parties to provide the best possible value for them. To comprehend the changes in the development of value propositions, Cheung et al. (2010) pointed out recognizing the fact that it becomes simpler for customers to examine their supply chains to spot interchanges occurring several ties away, thus offering supplementary lead time for strategic and operational planning and arrangements. This can also be considered handling the “producer as a customer” (Cheung et al., 2010). Producer credibility can be considered a relationship capability, in which the duration of collaboration is presented as a warrant for the closeness of social relationships between collaborators (Dyer & Chu, 2000; Li et al., 2010). Dyer and Chu (2000) suggested that prolonged interplay between parties would be useful for obtaining a profound comprehension of one another. Lengthy collaboration also permits parties to reduce information asymmetries, distribute private knowledge, and facilitate trust development (Poppo et al., 2008). Trust can be defined as one partner’s reliance that the other partner in the interchange collaboration will not abuse the first party’s vulnerabilities (e.g., Li et al., 2010). Trust can also be defined as the reliance that the collaboration partner holds on the integrity and complaisance of other collaborators (Kumar et al., 1995). Producers’ corporate images and reputations are also unified with trust development (E. Y. Huang et al., 2015; Parasuraman et al., 2005). When behavioral norms and trust are generated, parties are more efficient in developing information flow, communication, solidarity, and knowledge sharing (Hult et al., 2004; Leonardi & Treem, 2012). If the firm focuses on enhancing cooperative performance alone, inter-firm relational norms and trust become even more significant assets for this end (Liu et al., 2009).

Responsiveness to the producer can be considered a relationship capability in terms of the effectiveness with which problems are handled, the willingness to help the producer, and the speed with which a response to a problem or question is made (Gotzamani & Tzavlopoulos, 2009; E. Y. Huang et al., 2015; Parasuraman et al., 2005). Further, joint sense-making, information exchange, and knowledge unification have been shown to be important factors for the consuming firm–providing firm relationship, especially from a learning perspective (Cheung et al., 2010; Selnes & Sallis, 2003), and are connected to responsiveness to the producer.

Against this background, this study proposes that firms are expected to gain higher digital service performance when the relationship is characterized by producer credibility and the consuming firm’s responsiveness to the producer. The parties who nurture long-term relationships tend to build the best possible solution in line with customer needs. In this sense, we believe that the relationship’s goal is to serve the demands of the customer and is thus considered the driver of digital service performance. Consequently, these relationship capabilities can enhance performance in terms of finances, operations, and sales. Based on the literature and arguments aforesaid, we propose the following hypotheses:

H3: Relationship capabilities positively affect digital service performance.

H3a: Producer credibility positively affects digital service performance.

H3b: Responsiveness to the producer positively affects digital service performance.

RESEARCH MODEL

There are two important reasons why this study proposes that the relationships between digital service capabilities, in terms of product capabilities, service capabilities, relationship capabilities, and performance are important, and they were empirically examined in the context of digital B2B services. First, from a theoretical point of view, earlier research has suggested that capability has a direct impact on performance. However, the presumption is that small firms, in particular, should have different types of interrelated capabilities to increase different areas of performance. In this study, performance is further split into three components: financial performance, operational performance, and sales performance. As we consider online store-producing services conducted in a digital context, we use the term digital service performance, which refers to a service that only functions through the web. Second, from a practical perspective, trade is being digitalized, and a larger number of products and services are sold through digital channels. Further, B2B is different from business-to-consumer (B2C) when it comes to digital services, and this context requires a different approach. What works in the consumer world does not always translate into a B2B context. Thus, it is crucial to understand the types of capabilities needed to maintain high performance in a digitalized B2B environment. The research model is shown in Figure 1. In this study, an IT-producing firm refers to the firm that sold the digital service (i.e., an online shop) to an online shop operator (IT-consuming firm). The IT-consuming firm supplies an online shop and uses it to sell goods and/or services to customers. The customer can be either a consumer or a firm that buys goods and/or services online. This study focuses on the relationship between the IT-producing firm and the IT-consuming firm – the IT-producing firm’s digital service capabilities and the digital service performance of the online shop operator (IT-consuming firm).

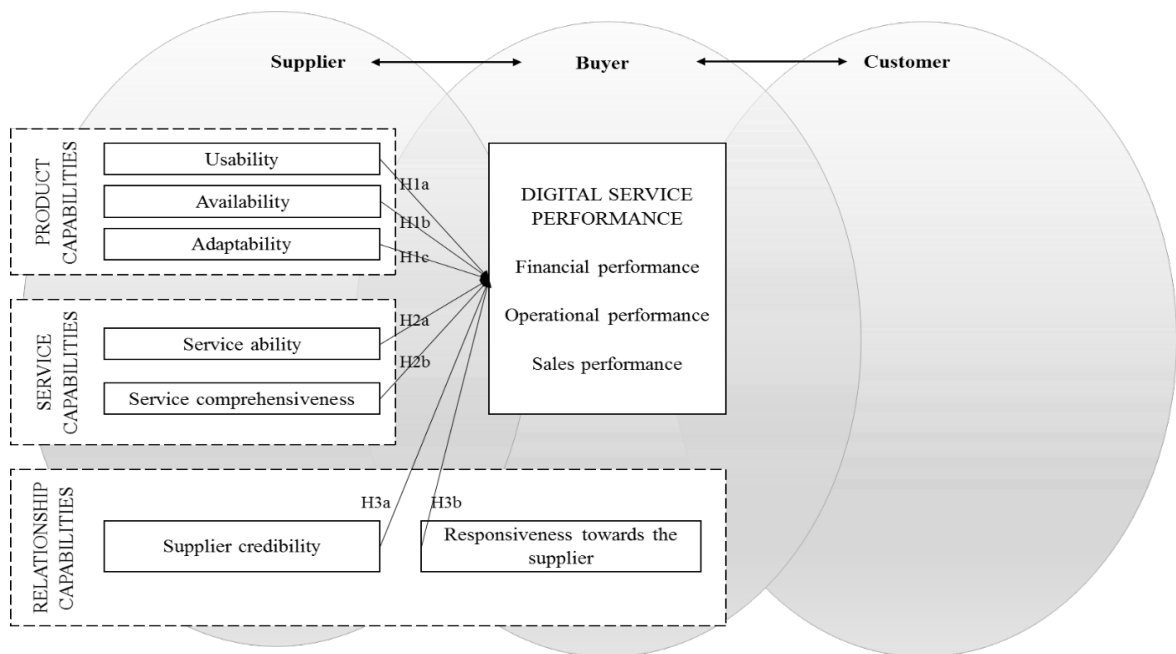


Figure 1. Research model and hypotheses

METHODOLOGY

SCALE DEVELOPMENT

A survey was utilized to gather data on managerial assessments of digital service capabilities (product, service, and relationship capabilities) and digital service performance (including financial, operational, and sales performance). The scales of the independent variables utilized were adopted from former research (see Table 1) and were shaped for this study via a pre-test in collaboration with experienced researchers. All items used were assessed on five-point Likert-type scales, ranging from strictly disagree (1) to strictly agree (5). The dependent variable was digital service performance (formed in the shape of financial, operational, and sales performance), which was assessed on a four-point scale, alternating from weak (1) to excellent (4). Thus, digital service performance was measured subjectively, as reliable objective performance data are rarely available and are often not directly comparable across different firms or industries. Scholars have also found that subjective measures correlate significantly with objective measures (e.g., Venkatraman & Ramanujan, 1987). Thus, IT-consuming firms were asked to evaluate the quality of their online stores, their experience with the service during the procurement process, their cooperation with the IT-producing firm, and their financial, operational, and sales performance. The aim was to gain an understanding of which factors related to digital services that IT-consuming firms perceived affected their performance, informing IT-producing firms of capabilities to invest in delivering the best value to their customers.

Two control variables were used in the study. One was firm size (surveyed by the number of employees in a firm that had supplied an online shop), as there is likely to be a favorable relationship between firm size and digital service performance. The second control variable was online shop age (surveyed by the number of years the shop had been in existence). A firm that is more experienced in e-commerce is also assumed to perform better in e-commerce.

Table 1. Variables used in the study

	Variables and items	References	Loadings	α
Product capabilities	Usability	Blut et al. (2015); DeLone and McLean (2003); Gotzamani and Tzavlopoulos (2009); E. Y. Huang et al. (2015); Mahmood et al. (2008); Oliveira and Roth (2012); Parasuraman et al. (2005); McLean et al. (2018); Rita et al., 2019; Tzavlopoulos et al. (2019); Wagner et al. (2020); Zeithaml et al. (2002); R. Zhang et al. (2021)	0.857–	0.877
	Our online store is easy to learn and use. Our online store's features are easy to find.		0.866	
	Availability	Blut et al. (2015); DeLone and McLean (2003); Gansser et al. (2021); Gao et al. (2021); Gotzamani and Tzavlopoulos (2009); E. Y. Huang et al. (2015); Mahmood et al. (2008); Oliveira and Roth (2012); Omar et al. (2021);	0.436–	0.810
	Our online store protects customers' e-commerce behaviors.		0.777	
	Our online store has taken care of the protection of payment transactions. Our online store is running constantly.			

	Variables and items	References	Loadings	α
	Our online store operates without delay. Our customers can handle the entire purchase process on a mobile device. Our online store always works correctly. Effortless payment procedures are connected to our online store.	Parasuraman et al. (2005); Rita et al., 2019; Tzavlopoulos et al. (2019); Wagner et al. (2020); Zeithaml et al. (2002); Zhu (2004); Zhu and Kraemer (2002); Ziaie et al. (2021)		
	Adaptability With our online store, you can complete tasks quickly. Our online store has good marketing functions. It is possible to include useful analytics in our online store. We can connect other tools we need to our online store. In our online store, it is possible to personalize content on a customer-specific basis. Our online store is integrated with our other information systems.	Blut et al. (2015); DeLone and McLean (2003); Gotzamani and Tzavlopoulos (2009); Mahmood et al. (2008); Oliveira and Roth (2012); Tzavlopoulos et al. (2019); Wagner et al. (2020); Zeithaml et al. (2002); Zhu (2004); Zhu and Kraemer (2002)	0.763– 0.539	0.769
Service capabilities	Service ability We were adequately informed by the online store producer during our online store acquisition and deployment process. The online store producer solved the problems related to our online store efficiently and quickly. The online store producer actively solicits customer feedback. You can get high-quality customer service from the online store producer. You can reach the customer service representative of the online store producer whenever necessary. The online store producer delivered the online store within the promised timeframe. The online store producer's offer was truthful.	Blut et al. (2015); Gansser et al. (2021); Gao et al. (2021); P. L. Huang et al. (2019); Oliveira and Roth (2012); Parasuraman et al. (2005); Ponsignon et al. (2011); Tzavlopoulos et al. (2019); Zou et al. (2021)	0.480– 0.855	0.915

	Variables and items	References	Loadings	α
	The price of the online store was reasonable. We used our input reasonably in the online store procurement process.			
	Service comprehensiveness Relevant information about the online store was available from the online store producer to support our purchasing decisions. All the information systems we needed were connected to the online store. We were able to add the functionalities we wanted to the online store.	Blut et al. (2015); P. L. Huang et al. (2019); Oliveira and Roth (2012); Ponsignon et al. (2011); Roth and Menor (2003); Ziaie et al. (2021); Zou et al. (2021)	0.568– 0.907	0.782
Relation- ship capabilities	Producer credibility The online store producer actively seeks to build a long-term partnership with us. Our previous experience working with an online store producer was good. The online store producer has a good reputation in the market.	Felipe et al. (2020); Gansser et al. (2021); Gao et al. (2021); Gotzamani and Tzavlopoulos (2009); Oliveira and Roth (2012); Parasuraman et al. (2005); Poppo et al. (2008); Suoniemi et al. (2021); Yu et al. (2021); J. Zhang and Zhu (2019); Zou et al. (2021)	0.832– 0.869	.837
	Responsiveness to the producer We actively participate in the production of services provided by online store producers. We share all requested/required information with the online store producer. We have taken the actions requested by the online store producer that relate to the online store.	Cheung et al. (2010); E. Y. Huang et al. (2015); P. L. Huang et al. (2019); Selnes and Sallis (2003); Rahmati et al. (2021); Yu et al. (2021); J. Zhang and Zhu (2019); Zou et al. (2021)	0.731– 0.850	0.753

SAMPLE AND DATA COLLECTION

The study followed a deductive approach; thus, data were gathered using a survey. Random sampling was used to select the respondents, and the relevant respondents were acquired from a database of company information service providers. The target population of this study was Finnish firms that had an online shop in use (referred to as IT-consuming firms in this paper). The directive number of such firms was 7,500, from which 2,541 firms were selected as the initial sample. The survey reached 2,312 respondents, as 229 addresses were invalid (either because the e-mail address was wrong, or the

person no longer worked in the company). From 107 firms, 109 valid responses (two of the companies each had two respondents) were received, which equals a response rate of about 4.7%. This was considered sufficient with respect to the response rate (Saunders et al., 2007) and sample size (Krejcie & Morgan, 1970) in a study such as this. The response rate does not account for the effect of sampling and coverage bias and thus is not the best way to estimate the accuracy of the results. Further, in the case of this study, the accuracy of the survey results should be assessed by the representativeness of the respondents. As the initial sample contained about 30% of the target population, the sample was representative of a large number of the entire target population. In addition, a non-response test performed among early and late respondents (Armstrong & Overton, 1977) exposed no specific bias. The questionnaire was sent to individuals in managerial positions who were responsible for digital business and customer service tasks. Thus, the respondents had the appropriate background and expertise to respond to a survey that investigated firms' digital businesses. Thus, it is likely that the responses represent the target population well.

Using a single respondent from one organization (Ketokivi, 2019) can cause problems in terms of common method variance (Podsakoff et al., 2003). However, if the studied organizations are small and the level of analysis is a single function within a firm (a digital business, in this study), a single-respondent design is applicable (Flynn et al., 2018). Despite this, we used several remedies to avoid common method variance. In terms of procedural remedies, we separated the measures of independent and dependent variables because it was not possible to gather responses from distinct sources. The confidentiality and anonymity of the survey responses were ensured, and the questionnaire was designed in such a way that the respondents could not establish cause-effect links between the dependent and independent variables. In addition, different response formats were used to avoid common method bias. We also introduced a delay between measuring the independent and dependent variables. In the cover letter, we made the respondents aware that their survey answers would remain anonymous to reduce the possibility of garnering only socially desirable responses. Statistically, the possibility of common method bias was examined via Harman's single-factor test. In the unrotated factor solution on items connected to the dependent and independent variables, more than one factor emerged, and the highest portion of variance explained by one factor was 34.57%. Thus, common method variance did not cause problems.

The demographics of the respondents are as follows. Roughly 73% of the respondents represented micro-firms employing fewer than 10 persons, while about 9% represented small firms. About 17% did not answer the question. About 48% of the sample represented firms that had had an online shop for less than 5 years, while about 50% of the sample represented firms that had had an online shop for more than 5 years. Two percent of the respondents did not answer.

RESULTS

RELIABILITY AND VALIDITY TESTING

The calculated correlations between the variables are shown in Table 2. Digital service performance (in the shape of operational, financial, and sales performance) had statistically significant and positive correlations with product, service, and relationship capabilities. The data were also used to estimate reliability and validity. This evaluation was executed by assessing single-factor item loadings and scale reliabilities (Table 1). Convergent validity was satisfied, as every item loaded greatly on its indicated variables. Discriminant validity was also apparent, as the cross-loading between the items and the variables was small. The reliability of the scales was tested utilizing Cronbach's α . All values were higher than 0.7 (see Table 1), suggesting that all measures had adequate rates of reliability (Hair et al., 1998).

Table 2. Correlation analyses

	1	2	3	4	5	6	7	8	9
Product capabilities									
1 Usability	1.000								
2 Availability	0.276**	1.000							
3 Adaptability	0.312***	0.440***	1.000						
Service capabilities									
4 Service ability	0.274**	0.420***	0.360***	1.000					
5 Service compr.	0.280**	0.382***	0.572***	0.582***	1.000				
Relationship capabilities									
6 Producer credib.	0.207*	0.422***	0.352***	0.730***	0.590***	1.000			
7 Responsiveness	0.054	0.406***	0.341***	0.351***	0.436***	0.454***	1.000		
Digital service performance									
8 Financial	0.276**	0.433***	0.410***	0.347***	0.233*	0.342***	0.287**	1.000	
9 Operational	0.331***	0.528***	0.544***	0.411***	0.522***	0.416***	0.314***	0.546***	1.000
10 Sales	0.225*	0.366***	0.356***	0.291**	0.207*	0.306**	0.316***	0.829***	0.504***

*** $p \leq 0.001$, ** $0.001 < p \leq 0.01$, * $0.01 < p \leq 0.05$, + $0.05 < p \leq 0.1$

TESTING THE EFFECTS

Hypotheses H1–H3 were tested using linear regression analyses. Linear regression is a way to study the relationship between dependent and independent variables with practical applications (Yan & Su, 2009). Table 3 presents the results of the regression analyses for the hypothesized links between digital service capabilities and digital service performance. Regarding H1 (H1a, H1b, and H1c), which hypothesized a connection between product capabilities (usability, availability, and adaptability) and digital service performance, H1b was partially supported, and H1c was supported. Hypothesis H1a was not supported. Regarding H1b, availability was found to influence operational performance ($\beta = 0.293$, $p \leq 0.05$). H1c was also supported: adaptability was found to affect financial performance ($\beta = 0.470$, $p \leq 0.05$), operational performance ($\beta = 0.345$, $p \leq 0.05$), and sales performance ($\beta = 0.320$, $p \leq 0.1$).

Regarding H2 (H2a and H2b), which hypothesized a connection between service capabilities (service ability and service comprehensiveness) and digital service performance, H2a was not supported, and H2b was partially supported. Regarding H2b, service comprehensiveness was found to influence financial performance ($\beta = -0.243$, $p \leq 0.1$) and operational performance ($\beta = 0.186$, $p \leq 0.1$) but not sales performance ($\beta = -0.165$, $p > 0.1$).

Regarding H3 (H3a and H3b), which hypothesized a connection between relationship capabilities (producer credibility and responsiveness to the producer) and digital service performance, neither H3a nor H3b was supported. The control variable number of employees did not have a statistically significant influence on digital service performance in the models. However, online shop age had a statistically significant influence on the model of sales performance. We interpret these observations to mean that the influence of digital service capabilities on digital service performance is not influenced by firm size. However, the online shop age may help the firm translate digital service capabilities into sales performance. The hypothesis testing results are summarized in Table 4.

Table 3. Regression analyses results

Dependent variables	Digital service performance					
	Financial		Operational		Sales	
	β	Std. error	β	Std. error	β	Std. error
Controls						
No. of employees	-9.039E-5	0.000	0.000	0.000	-4.414E-5	0.000
Online shop age	0.192	0.164	0.171	0.130	0.279 ⁺	0.167
Main effects						
Usability	0.014	0.115	0.140	0.091	0.059	0.116
Availability	0.224	0.156	0.293*	0.124	0.206	0.158
Adaptability	0.470*	0.183	0.345*	0.145	0.320 ⁺	0.185
Service ability	0.071	0.164	-0.039	0.130	0.006	0.165
Service compr.	-0.243 ⁺	0.134	0.186 ⁺	0.106	-0.165	0.135
Producer credibility	0.181	0.159	0.026	0.126	0.119	0.161
Responsiveness	0.075	0.124	-0.089	0.098	0.207	0.125
Model summary						
F	4.449***		8.559***		3.808***	
R ²	0.351		0.510		0.320	
Adjusted R ²	0.272		0.450		0.236	

*** $p \leq 0.001$, ** $0.001 < p \leq 0.01$, * $0.01 < p \leq 0.05$, + $0.05 < p \leq 0.1$

Table 4. Summary of hypothesis test results

Hypotheses	Hypothesis support	Interpretation
H1: Product capabilities positively affect digital service performance		
H1a: Usability positively affects digital service performance	Not supported	Usability does not affect financial, operational, sales performance.
H1b: Availability positively affects digital service performance	Partially supported	Availability affects operational performance but not financial or sales performance.
H1c: Adaptability positively affects digital service performance	Supported	Adaptability affects financial, operational, and sales performance.
H2: Service capabilities positively affect digital service performance		
H2a: Service ability positively affects digital service performance	Not supported	Service ability does not affect financial, operational, or sales performance.
H2b: Service comprehensiveness positively affects digital service performance	Partially supported	Service comprehensiveness negatively affects financial performance but positively influences operational performance. Service comprehensiveness does not affect sales performance.

Hypotheses	Hypothesis support	Interpretation
H3: Relationship capabilities positively affect digital service performance		
H3a: Producer credibility positively affects digital service performance	Not supported	Producer credibility does not affect financial, operational, or sales performance.
H3b: Responsiveness to the producer positively affects digital service performance	Not supported	Responsiveness to the producer does not affect financial, operational, or sales performance.

DISCUSSION

THEORETICAL IMPLICATIONS

By building on the RBV, this study contributes to the research on which IT-producing firms' digital service capabilities determine the digital service performance of IT-consuming firms. This study provides novel insights into the increasing research on utilizing capabilities outside organizational boundaries (Parida et al., 2015; Sjödin et al., 2020; Sore et al., 2022). Additionally, this study opens up a new perspective by focusing on the connections between online store producers and small operators. The main contributions are discussed below.

First, the study reveals some effects of IT-producing firms' product capabilities on IT-consuming firms' digital service performance. However, the results show that there are noteworthy differences in the influence of different categories of capability. Adaptability (H1c), determined by capabilities related to utilizing information gained via the integration of the digital product into other digital tools (e.g., marketing, personalization, and analytics), statistically significantly affects all three aspects of IT-consuming firms' digital service performance (financial, operational, and sales). This result (H1c) highlights the importance of integrating a digital front-end product with a back-end IT infrastructure (Zhu, 2004; Zhu & Kraemer, 2002), as well as integrating and analyzing data from different sources (Blut et al., 2015; Tzavlopoulos et al., 2019), which enables, for example, customer-specific personalization (Wagner et al., 2020) and ultimately leads to higher digital service performance. Another product capability, availability (H1b), for example, of security, different aspects of functioning, and mobile adaptation, has an effect on one aspect of digital performance, namely operational. Given that availability mainly refers to the functionality of e-commerce investments (Gansser et al., 2021; Gao et al., 2021; Rita et al., 2019; Wagner et al., 2020) and the understanding of how an organization is able to better conduct its operations (Chatterjee et al., 2021; Mithas et al., 2011), it is reasonable that availability directly affects only operational performance. In this case, the impact on financial and sales performance may arise indirectly and later through operational performance. The findings above are in line with previous research indicating that adaptability and availability capabilities are crucial features of a successful digital product (DeLone & McLean, 2003; Gansser et al., 2021; Gotzamani & Tzavlopoulos, 2009; E. Y. Huang et al., 2015; Mahmood et al., 2008; Omar et al., 2021; Parasuraman et al., 2005; Rita et al., 2019; Tzavlopoulos et al., 2019; Wagner et al., 2020; Ziaie et al., 2021). Contrary to previous studies that highlighted usability (H1a) as essential for the perceived value of a digital product (Gotzamani & Tzavlopoulos, 2009; Mahmood et al., 2008; Parasuraman et al., 2005), this study reveals that usability does not influence any aspects of the IT-consuming firm's performance. Thus, the results highlight the new situation of digital B2B services: usability is now taken for granted, and value is created through harnessing information from different sources to create superior service delivery (cf. Blut et al., 2015; Tzavlopoulos et al., 2019; Wagner et al., 2020).

Second, the results also suggest that the role of service process-related capabilities in determining service comprehensiveness (H2b) significantly influences two aspects of IT-consuming firms' digital service performance, namely financial (negative effect) and operational (positive effect). Since service comprehensiveness has been perceived as affecting performance, firms must invest in it. This, in turn, causes costs that may be the source of the negative influence on perceived financial performance. The positive effect of service comprehensiveness on operational performance may indicate that IT-consuming firms have been able to add all the functionalities they want to the online store (P. L. Huang et al., 2019; Ziaie et al., 2021; Zou et al., 2021), and the impact on sales performance may arise indirectly and later through operational performance. We also interpreted the outcome to indicate that finding a balance in service comprehensiveness is considered a highly significant determinant of digital service performance creation. Further, service ability (H2a) was not considered equally remarkable, which challenges the results of previous studies (cf. Blut et al., 2015; Gao et al., 2021; P. L. Huang et al., 2019; Roth & Menor, 2003; Setia et al., 2013; Sousa & da Silveira, 2017; C. C. Yang et al., 2009; Zou et al., 2021). The service abilities focus on how the service is produced rather than what is produced, and therefore can be considered necessary to the online shop production process; thus, they did not appear to have a particular impact on digital service performance.

Third, referring to H3a and H3b, the results show that the capabilities associated with the relationship between the producing firm and the consuming firm do not affect IT-consuming firms' performance to the same extent. These results contribute to the capabilities literature by showing that the shift in focus from technical product-related capabilities to relationship-related capabilities is not yet evident among small online store operators.

Furthermore, this study revealed that the size of an IT-consuming firm, in terms of the number of employees, does not have an effect on any of the aspects of the IT-consuming firm's digital service performance. However, online shop age had a statistically significant influence on sales performance, indicating that age may help firms process all digital service capabilities to sales performance. We interpreted the result as the longer an online shop has existed, the more the operators are able to use the different features of the digital product in terms of sales performance.

MANAGERIAL IMPLICATIONS

The findings of this article have significant implications for IT-producing firms. Most notably, the study offers empirical evidence of the capabilities valued by IT-consuming firms, providing a model for IT-producing firms to use when deciding on a future focus. The study results suggest that IT-producing firms should concentrate on leveraging service comprehensiveness, as there has been a shift in the B2B context from merely selling a digital product and the services related to it.

Another interesting issue revealed by the study is the shift in the weighting of digital product features. It seems that usability-related issues are now taken for granted, and the emphasis is on features that support the use of information to create value. These features include possibilities of integrating the digital product into other digital tools, combining data from different sources, and enabling the analysis of data for marketing purposes, for example. In addition to offering tools with different integration possibilities, supporting IT-consuming firms in making the most of the possibilities would be very helpful.

LIMITATIONS AND FURTHER RESEARCH

This study has various limitations that can be addressed in future studies. First, the sampling may restrict the generalization of the implications, as the data were collected from online shop operators from a single country. Prudence should be practiced when applying the results to other cultural environments. Second, the control variables were limited to two: the size of the IT-consuming firm and the online shop age. The comprehension of the relationship between digital service capabilities and digital service performances would benefit from future research that takes into account additional

control variables. Third, the dependent variables included only financial, operational, and sales performance. Thus, the theoretical model of this study can be further studied by using other performance measures, such as market performance, as dependent variables. Finally, the data were collected from one country, Finland, which may limit the generalizability of the results. However, we believe that the results are applicable to the online store context in other similar countries as well – at least, in developed countries. Further research could address these limitations and build on the findings of this study.

CONCLUSIONS

This study focused on the connection between an IT-producing firm's digital service capabilities and the digital service performance of an IT-consuming firm, an online shop operator. Numerous studies in the literature, particularly in the areas of marketing and information systems, have explored the success factors of digitally offered services. This article contributes to current studies in two main areas. First, this study offers a model that determines the digital service capabilities (i.e., product, service, and relationship capabilities) that have an impact on IT-consuming firms' digital service performance. The study was executed in a B2B setting from the viewpoint of IT-consuming firms, presenting a novel understanding of influential digital service capabilities. Second, the examination of digital service capabilities was extended to cover the long-term relationship between IT-producing firms and IT-consuming firms, instead of holding back and examining the relationship that lasts only the length of the procurement period of a digital product. This focus revealed new insights into the digital service capabilities that affect IT-consuming firms' digital service performances, as discussed below.

A digital product's adaptability significantly affects all three aspects of an IT-consuming firm's digital service performance (financial, operational, and sales). Another product capability – availability – has an effect on one aspect of digital performance, namely operational. The results also suggest that the role of service process-related capabilities in determining service comprehensiveness significantly influences two aspects of IT-consuming firms' digital service performance, namely financial (negative effect) and operational (positive effect). The results show that the capabilities associated with the relationship between the producing firm and the consuming firm do not affect IT-consuming firms' performance to the same extent.

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